

PROCEEDINGS  
OF THE  
BIOLOGICAL SOCIETY OF WASHINGTON

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THE STATUS OF *THAMNOPHIS BUTLERI* COPE,  
AND A REDESCRIPTION OF *THAMNOPHIS*  
*BRACHYSTOMA* (COPE).

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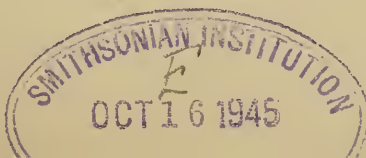
The rather consistent reduction of scale rows in specimens of *Thamnophis butleri* from New York and Pennsylvania, together with a smaller number of labial scales, has induced me to examine the available material from throughout the range of this species. *Thamnophis butleri* has had an interesting history. Cope described a specimen from Richmond, Rush County, Indiana, as *Eutaenia butleri* in 1888, and in 1892, he described *Eutaenia brachystoma* on the basis of a specimen from near Franklin, Venango County, Pennsylvania. Although noting the decided reduction in scutellation of the Pennsylvania specimens, Ruthven (1908) did not have sufficient specimens for proper analysis, and included *brachystoma* in the synonymy of *butleri*. Blanchard (1925) possibly because of the similarity between *butleri* and *radix*, considered *butleri* a subspecies of *radix* in his key. In 1932, Davis showed the validity of considering *butleri* a species. In view of the present study, as will be shown, it seems advisable to resurrect Cope's "*Eutaenia brachystoma*" and to recognize both *butleri* and *brachystoma* as valid species.

*Thamnophis butleri* (COPE)

*Eutaenia butleri*, 1888, COPE, Proc., U. S. Nat. Mus., 11: 399.

*Thamnophis butleri*, 1908, RUTHVEN, Bull., U. S. Nat. Mus., 61: 87 (in part).

*Type*.—A specimen taken near Richmond, Rush County, Indiana. The actual specimen seems to have been part of a collection sent to Cope for study from Purdue University. The specimen was not returned to Purdue, and has not been found in any of the known Cope collections.



*Diagnosis*.—A small *Thamnophis* in which there are 19 scale rows, and normally 7 upper labials.

*Description*.—A small *Thamnophis* with the scales arranged in 19–19–17 rows. Four Ohio and three Michigan specimens have the scales in 17–19–17 rows. One Ohio specimen has 19–17–17 rows, and one Michigan 17–17–15. The lateral scales are wider than the dorsal and all scales are keeled. The lateral stripe occurs on the 2nd, 3rd, and 4th rows. The inter stripe blotches are not the same size as occurs in *radix*. The upper labials are normally 7, frequently 6, but very rarely 8. There are normally 8 lower labials, although 9 are frequent. An occasional specimen may have 7 or 10 lower labials. There is one pre-ocular and normally 3 post-oculars, although 2 post-oculars are common. There is one temporal in the first row, and there may be either one large and one small, or just one large temporal in the second row. The anal plate is not divided. The head plates are normal as in the genus; the eye is in contact with the 3rd and 4th upper labial, and the loreal is present. The ventrals in 119 males range from 132 to 147, mean 141; in 104 females they range from 129 to 146, mean 139. The caudals in 91 males<sup>1</sup> vary from 57 through 71, mean 64; while in 97 females they vary from 51 to 63, mean 55. In 91 males the tail/total length ratio is from .219 to .265, mean .250; in 97 females from .200 to .244, mean .222. The largest specimen examined was a male from Middlesex County, Ontario, (R. O. M. Z., no. 5527), with a total length of 573 mm., tail, 130 mm.

*Range*.—The snake occurs in glaciated territory in southeastern Wisconsin and southern Michigan, through Indiana (east of the dunes), and Ohio, and in southwestern Ontario. It is frequently found near water or in moist situations.

*Material examined*:<sup>2</sup>—

WISCONSIN (24 ♂, 15 ♀) *Dodge County*: Atwater; *Milwaukee County*: Bay View, Milwaukee, Wauwatosa; *Racine County*: Corliss; *Waukesha County*: Big Bend, Menominee Marsh, Nashotah, Upper Nemahbin Lake.

MICHIGAN (37 ♂, 51 ♀) *Eaton County*: Olivet; *Huron County*: Sand Point, Stoney Island, Bay Port, Saginaw Bay; *Ingham County*: East Lansing; *Livingston County*: Brighton, Byron; *Monroe County*: Point Place; *Oakland County*: Pontiac; *Shiawassee County*; *Washtenaw County*: Ann Arbor, Chelsea, Ypsilanti; *Wayne County*: Northville Hatchery.

OHIO (42 ♂, 17 ♀) *Champaign County*: Brush Lake; *Crawford County*: Cranberry Twp.; *Cuyahoga County*: East Rockport; *Erie County*: Sandusky; *Franklin County*: Columbus; *Greene County*: near Xenia, Miami Twp.; *Hardin County*: near Mt. Victory; *Huron County*: Greenfield Twp.; *Richmond Twp.*; *Logan County*: West Liberty; *Lucas*

<sup>1</sup> The difference in numbers of specimens used was occasioned by the number of incomplete tails.

<sup>2</sup> Numbers after state names refer to numbers of specimens seen from these areas.

County: Bono, Reno Beach, Toledo; Marion County; Montgomery County: Dayton; Ottawa County: East of Bono, Erie Twp., Port Clinton; Portage County: Hiram; Richland County: Jackson Twp., Plymouth Twp.; Seneca County: Venice Twp.; Wayne County: Wooster.

INDIANA (3 ♂, 1 ♀) DeKalb County: Waterloo; Kosciusko County: Turkey Lake; Marion County; Marshall County: Lake Maxinkuckee; Porter County: near Valparaiso; Rush County: Richmond.

ONTARIO (15 ♂, 25 ♀) Middlesex County: near Newbury; Kent County: Rondeau Park.

THAMNOPHIS BRACHYSTOMA (COPE).

*Eutaenia brachystoma*, 1892, COPE, Amer. Nat., 26: 964-5.

*Thamnophis butleri*, 1908, RUTHVEN, Bull., U. S. Nat. Mus., 61:87 (part).

*Thamnophis radix butleri*, 1927, BISHOP, N. Y. State Mus., handbook 3: 91.

Type:—An adult male, A. N. S. P., 10751, taken on the Alleghany River, near Franklin, Venango County, Pennsylvania, by Miss Anna M. Brown, in 1891 (?).

Diagnosis:—A small *Thamnophis* in which the scale rows are normally 17 and the upper labials 6.

Description:—A small snake in which the scales are almost always arranged in 17-17-17 rows. Four Pennsylvania specimens, including the type, have 17-19-17 rows, and one New York specimen has 19-19-17 rows. The lateral scales are the widest. All scales are keeled, with the exception that the scales bordering the ventrals may be lightly keeled or not at all. The stripes are on the 2nd, 3rd, and 4th rows anteriorly always; posteriorly it may be on 2 and 3. The dorsal stripe is always present, though tending to disappear. The blotches between stripes are much reduced, mostly to such an extent that they appear more as a stripe border, or they may be absent. Generally, this snake tends to be darker than *butleri*. The head is not definitely distinct from the neck. The oculars are normally 1-3, but may be 1-2. The temporals are usually 1-2, with one large and one small in the posterior row. The head plates are normal for the genus; the loreal is present; and the eye is in contact with the 3rd and 4th upper labials. The upper labials are normally 6, very rarely they may be 7. The lower labials are normally 8, sometimes 7 or 7-8, but are never 9. In 117 males, the ventrals vary from 134 to 146, mean 140, while in 107 females they range from 132 to 146, mean 139. The caudals in 103 males are from 57 to 72, mean 67; in 98 females, they vary from 51 to 64, mean 59. The tail in 103 males has a total length ratio of from .207 to .276, mean .246; in 98 females, from .198 to .246, mean .222. The largest specimen examined was a female (C.M. 9503) from near Tionesta, Forest County, Pennsylvania, with a total length of 506 mm., tail, 118 mm.

Range:—This species at present is known from areas in southwestern

New York and in northwestern Pennsylvania within the upper Alleghany River drainage. It occurs both in glaciated and unglaciated areas.

*Material examined:*

NEW YORK (78 ♂, 74 ♀) *Cattaraugus County*: Lillibridge Creek, near Limestone; *Chataqua County*: Poland Center, near Randolph.

PENNSYLVANIA (37 ♂, 32 ♀) *Clarion County*: Cooksburg; *Forest County*: 12 miles NE of Tionesta; Brookston; *McKean County*: Port Alleghany; *Mercer County*: Sandy Lake; *Venango County*: near Wesley, near Franklin; *Warren County*: near Warren.

*VARIATION*:—There is a decided difference in scale rows between the two species. The scales of *Thamnophis butleri* are normally arranged in 19-19-17 rows, while those of *T. brachystoma* are arranged in 17-17-17 rows. In the 7 specimens of *butleri* having a 17-19-17 pattern, an additional row begins near the 25th ventral and continues to near the 100th. In the specimen having the 19-17-17 pattern, the 4th row is dropped at the 40th ventral. Some of the Wisconsin specimens show the 21 rows, characteristic of *Thamnophis radix*, in the neck region. In the specimens of *Thamnophis brachystoma* with a pattern of 17-19-17 rows, the extra row is added, as in *butleri*, near the 25th ventral and continuing to the 100th. In the one New York specimen showing 19-19-17 rows, the 4th row is dropped at the 105th ventral.

There is no appreciable difference in the number of ventral scales between the two species. The ventral count is slightly higher in the case of some Wisconsin *butleri*. However, *T. brachystoma* has a slightly higher mean number of caudals than does *T. butleri*; in *T. brachystoma* the range is 53 to 71, mean 67, while in *T. butleri* the range is 52 to 70, mean 66.

The difference in upper labials, though not as marked as the scale rows, is a distinguishing character. *T. brachystoma* has 6 upper labials, only 6 (.04%) having 7. In *T. butleri*, however, the upper labials number 7 in 57% of the specimens and 6 in 39%. In the remaining 4% the upper labials number 8. The lower labials of *T. brachystoma* never exceed 8, but in *T. butleri* 21% of the specimens have 9 lower labials.

Males of *Thamnophis butleri* measured from 250 mm. to 540 mm., with the tail being 23 to 26% of the total length. The males of *T. brachystoma* measured from 290 mm. to 440 mm., the tail being 24 to 28% of the total length. Females of *T. butleri* measured from 260 mm. to 560 mm., the tail being 20 to 24% of the length, while females of *T. brachystoma* measured from 250 mm. to 506 mm., the tail being 21 to 25% of the length. The head size of both species was checked, and the difference in size of the head is so small that it is hardly recognizable as a distinguishing character.

Both *Thamnophis butleri* and *brachystoma* are derived from *Thamnophis radix*, from which species they may be distinguished by the differences in position of the lateral stripe, by the higher mid-body number (21) scale rows of *radix*, and by the higher number of labials, ventrals, and caudals of *T. radix*.

*DISTRIBUTION*:—As has been shown, *Thamnophis brachystoma* is



restricted to a few areas in New York and Pennsylvania. It seems reasonable to assume that *T. brachystoma* was derived from a pre-Wisconsin stock of *T. radix*, which may have extended its range during interglacial periods much further to the east than we now know it. The stock could conceivably been isolated by the advent of the Wisconsin glacier, and been able to survive in the Upper Allegheny drainage pattern (originated in pre-Wisconsin times) from which it is now moving northward into suitable areas within the glaciated territory.

From this, it must be surmised that *T. butleri* originated from a later stock of *T. radix* which moved eastward in post-Wisconsin times. The particular type of habitat desired by both species, draws me inevitably to the conclusion that *butleri* was able to establish itself and to succeed in living in a habitat distinct from a "Prairie Peninsula" type of habitat. The finding of *T. radix* in isolated patches of "Prairie Peninsula" in Ohio recently, supports this conclusion. Assuming then that *butleri* does not succeed well in a "Prairie Peninsula" type of habitat, the isolation of this species in Wisconsin is readily understandable. The Prairie Peninsula as outlined by Transeau (1935) gives an ecological reason for the isolation. The plotting of records on the master map used was done as accurately as the data available permitted. It will be seen on the map, that *Thamnophis butleri* generally is not found within known "Prairie Peninsula" types of habitat. Since such is the case, the species is isolated in Wisconsin because it cannot survive in a "Prairie Peninsula" type, and not because *T. radix* gradually excluded it from the Chicago Region as Davis (1932) suggested. This reason would also explain its rather spotty distribution in Indiana, where the "Prairie Peninsula" type of habitat is still fairly prominent, as well as its comparatively abundant distribution throughout the rest of its range, in which the particular prairie type of habitat is thinly spotted or absent.

*Thamnophis brachystoma* is separated from *T. butleri* by a minimum distance of 70 miles between the two closest records. In this region, northeastern Ohio, several collectors have failed to find either *brachystoma* or *butleri*.

**SUMMARY:**—*Thamnophis brachystoma* is recognized as a valid species because of the lower number of scale rows and upper labials, as well as by reason of its restricted range in New York and Pennsylvania. *Thamnophis butleri* is isolated in Wisconsin because it prefers a non-"Prairie Peninsula" type of habitat.

I wish to express my sincere thanks to the following persons and institutions for the loan of specimens and for their help: Dr. Howard K. Gloyd, Chicago Academy of Sciences; Dr. Emmett R. Dunn, Academy of Natural Sciences at Philadelphia; Messrs. Karl P. Schmidt and Clifford H. Pope, Chicago Museum of Natural History; Dr. Helen T. Gaige, Museum of Zoology, University of Michigan; Dr. E. B. S. Logier, Royal Ontario Museum of Zoology; Dr. Doris M. Cochran, United States National Museum; Dr. Charles M. Bogert, American Museum of Natural History; Dr. Sherman C. Bishop, University of Rochester; Mr. W. E. Dickinson, Milwaukee Public Museum; and to many others who

have given me aid, particularly in collecting. My special thanks are due to Mr. M. Graham Netting, Carnegie Museum, and Mr. Roger Conant, Philadelphia Zoological Society, for their invaluable aid during this study; and to my wife, Mrs. Ellen M. Smith, for examining specimens and helping with clarifying data.

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Map showing the localities of *Thamnophis butleri* (circles) and *Thamnophis brachystoma* (crosses). The terminal moraine is outlined.